

03050202-040

(Ashley River)

General Description

Watershed 03050202-040 is located in Dorchester and Charleston Counties and consists primarily of the *Ashley River* and its tributaries from Dorchester Creek to the Charleston Harbor. The watershed occupies 44,461 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Bohicket-Udorthents-Udipsammments-Yonges series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 44.9% urban land, 29.3% forested land, 13.1% nonforested wetland, 7.2% water, 4.1% forested wetland, 1.1% scrub/shrub land, and 0.3% agricultural land.

This segment of the Ashley River originates at Bacon Bridge and accepts drainage from the Dorchester Creek watershed (03050202-030). The river then flows past the Old Dorchester State Park and Middleton Gardens to receive drainage from Coosaw Creek, Olive Branch, and Sawpit Creek. Popperdam Creek enters the river near Magnolia Gardens, the Charleston U.S. Air Force Base, and the Municipal Airport. Further downstream, MacBeth Creek enters the river followed by Keivling Creek and Church Creek. The Ashley River is classified SA from Bacon Bridge to Church Creek, where it changes from SA to SA* (DO not less than 4 mg/l) and remains SA* to the entrance of Orangegroove Creek (Oldtown Creek). Between Church Creek and Orangegroove Creek, the Ashley River receives drainage from Bulls Creek (SA*), Brickyard Creek (SB), and Duck Island Canal (SA*). Downstream of Orangegroove Creek, the Ashley River reverts its classification to SA and drains into the Charleston Harbor and the Atlantic Ocean. In addition to the Old Dorchester State Park and the historic gardens and plantations, another natural resource in the watershed is the historic Charles Towne Landing State Park on the Ashley River near Bulls Creek. There are a total of 13.8 stream miles in this watershed and 13.9 square miles of estuarine areas.

Water Quality

<u>Station #</u>	<u>Type</u>	<u>Class</u>	<u>Description</u>
MD-049	P	SA	ASHLEY RIVER AT MAGNOLIA GARDENS
MD-246	P	SA*	CHURCH CREEK MOUTH
MD-135	S	SA*	ASHLEY RIVER AT S.C. 7 (NORTH BRIDGE)
MD-052	P	SA	ASHLEY RIVER AT SAL RR BRIDGE

Ashley River - There are three monitoring sites along this section of the Ashley River. At the furthest upstream site (**MD-049**), aquatic life uses are not supported due to dissolved oxygen excursions and occurrences of copper in excess of the aquatic life acute standard, compounded by a significant increasing trend in turbidity. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are

not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations. Downstream of Church Creek (**MD-135**), aquatic life uses are fully supported, but there is a significant increasing trend in turbidity. Recreational uses are fully supported.

At the furthest downstream site (**MD-052**), aquatic life uses are partially supported due to dissolved oxygen excursions. In addition, there was a significant decreasing trend in dissolved oxygen concentration and a significant increasing trend in turbidity. There was also a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions for these parameters. In sediments, very high concentrations of cadmium and nickel were measured in the 1998 sample, as was a high concentration of chromium. The cadmium concentration exceeded the Effects Range Low (ERL) concentration, but was less than the Effects Range Median (ERM) concentration. High concentrations of zinc were measured in the 1995 and 1998 sediment samples. Recreational uses are fully supported at this site.

Church Creek (MD-246) - Aquatic life uses are partially supported due to dissolved oxygen excursions. There is also a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Charles Towne Landing State Park Pond - The pond has been treated annually in the past ten years with aquatic herbicides in an attempt to control the growth of aquatic macrophytes that have impaired bank fishing and boating access. *Tilapia* were introduced in 1991, at a stocking rate of 200 fish/vegetated acre for a total of 1000 fish. The fish were restocked annually at the same rate and numbers from 1992 to 1996.

NPDES Program

Active NPDES Facilities

<i>RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD) COMMENT</i>	<i>NPDES# TYPE LIMITATION</i>
ASHLEY RIVER SCE&G/HAGOOD STATION PIPE #: 002 FLOW: 0.049	SC0002011 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER G&S ROOFING PRODUCTS PIPE #: 001-003 FLOW: M/R	SC0002771 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER KOPPERS INDUSTRIES NPL	PROPOSED MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R	EFFLUENT
ASHLEY RIVER TOWN OF SUMMERVILLE/WWTP PIPE #: 001 FLOW: 10.0 WQL FOR NH3-N,DO,TRC,BOD5	SC0037541 MAJOR DOMESTIC WATER QUALITY
ASHLEY RIVER MIDDLETON INN PIPE #: 001 FLOW: 0.014 WQL FOR TRC	SC0039063 MINOR DOMESTIC WATER QUALITY
ASHLEY RIVER AMERADA HESS #40260 PIPE #: 001 FLOW: M/R (PERMIT INACTIVATED)	SC0044202 MINOR INDUSTRIAL WQL FOR BOD
BRICKYARD CREEK G&S ROOFING PRODUCTS PIPE #: 003 FLOW: M/R	SC0002771 MINOR INDUSTRIAL EFFLUENT
CHURCH CREEK CHARLESTON CPW/PIERPONT PLT PIPE #: 001 FLOW: 1.5 WQL FOR NH3-N,DO,TRC	SC0026069 MAJOR DOMESTIC WATER QUALITY
COOSAW SWAMP DORCHESTER PUB.WKS./LOWER DORCHESTER PLT PIPE #: 001 FLOW: 4.0 WQL FOR BOD5,NH3-N,D0,TRC	SC0038822 MAJOR DOMESTIC WATER QUALITY

Nonpoint Source Management Program

Mining Activities

<i>MINING COMPANY</i> <i>MINE NAME</i>	<i>PERMIT #</i> <i>MINERAL</i>
CROSS COUNTY LAND & DEVELOPMENT CO. CROSS COUNTY MINE	0374-19 SAND/CLAY
CROSS CREEK INVESTORS, A PARTNERSHIP CROSS CREEK MINE	0425-19 SAND/CLAY
W. FRAZIER CONSTRUCTION, INC. MIDDLETON MINE	1012-35 SAND/CLAY

Land Disposal Activities

Landfill Facilities

<i>SOLID WASTE LANDFILL NAME</i> <i>FACILITY TYPE</i>	<i>PERMIT #</i> <i>STATUS</i>
MOORE DRUMS INDUSTRIAL	----- -----
CHARLESTON COUNTY DUMP	-----

MUNICIPAL	CLOSED
G&S ROOFING PRODUCTS INDUSTRIAL	IWP-046 -----
LOCKWOOD BLVD. DUMP MUNICIPAL	----- CLOSED

Land Application Sites

*LAND APPLICATION SYSTEM
FACILITY NAME*

*ND#
TYPE*

SPRAYFIELD
BURRIS CHEMICAL

ND0017736
INDUSTRIAL

Groundwater Contamination

The groundwater in the vicinity of the property owned by Koppers-Charleston (#SCD980310239) is contaminated with volatile and nonvolatile organics (Creosote) and metals. The source of the contamination includes surface impoundments, aboveground storage tanks, spills/leaks, and unpermitted disposals. The facility is currently in the assessment and remediation phases. The interim groundwater action construction has been completed. The surface water affected by the groundwater contamination is the Ashley River.

The groundwater in the vicinity of the property owned by Albright & Wilson Americas (#SCD003358389) is contaminated with volatile organics, metals, petroleum products, nitrates, pesticides, and herbicides due to aboveground storage tanks and underground storage tanks. The facility is currently in the assessment and remediation phases. The interim measures have been completed. The surface water affected by the groundwater contamination is the Ashley River.

The groundwater in the vicinity of the property owned by Lockheed Martin Aerospace (#SCD048372023) is contaminated with volatile organics and metals due to pits, ponds, and lagoons. Chromium and trichloroethylene are the main contaminants. The facility is currently in the remediation phase. The surface water affected by the groundwater contamination is a tributary of Brickyard Creek.

Growth Potential

The west bank of the Ashley River contains numerous historic structures including Middleton Place, Drayton Hall, Magnolia Gardens, Runnymede Plantation, and Charles Towne Landing State Park; all are important scenic, cultural, and tourism resources. Areas with a high potential for growth include Amberwood, Jerico on the Ashley, Summerfield, River Oaks, and Shadowmoss in Charleston County; and Coosaw Creek, Whitehall, Avanti Tract, Appian Landing, Bakers Landing, Indigo Fields, and Ricefield/Windsor Hill in Dorchester County. There is water and sewer services available to all these growth areas.

Watershed Protection and Restoration

Special Projects

Brickyard Urban Watershed NPS Mitigation

Brickyard Creek flows through a commercial/ industrial section of Charleston County to the Ashley River. It is highly impacted by urban runoff. A 1990 Section 319 project in this watershed identified the categories and locations of NPS inputs, formed a task force of cooperating agencies, designed a set of watershed specific BMPs, and with the help of the cooperators, forged the *Brickyard Creek NPS Action Plan*. Charleston County government agreed to consider implementing the recommendations of the Plan.

Special Models

The Charleston Harbor Models

Two different models have been developed for wasteload allocations purposes for the Charleston Harbor system. The initial model was developed through the Charleston Harbor Project (CHP) and the second model was developed by Applied Technologies and Management (ATM) for the Cooper River Water Users Association. Working in conjunction with the Department, the University of South Carolina, Clemson University, and the United States Geological Survey (USGS), CHP's goal was to develop a tool for the Department's use in point source wasteload allocation and Total Maximum Daily Load (TMDL) determination. The modeled domain, for both models, encompasses the Cooper River and its major tributaries from Pinopolis Dam to its confluence with the Wando River, the Wando River from its headwaters to the confluence with the Cooper River, and the Ashley River from Bacon Bridge downstream to the U.S. Hwy. 17 Bridge. Hydrodynamics, for CHP's effort, are modeled using the one-dimensional BRANCH model while water quality is modeled using the one-dimensional Branched Lagrangian Transport Model. Modeling data were collected in May and August of 1993 by the Department and the USGS. Hydrodynamics, for ATM's effort, are modeled using the two-dimensional boundary fitted circulation model. Water quality is modeled using the two dimensional WQMAP which uses EPA WASP5 eutrophication model kinetics. Modeling data were collected in September 1996 by ATM and August of 1993 by the Department and the USGS. The Department plans on using the two models in concert to determine TMDL and point source wasteload allocations for the Charleston Harbor system.